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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/974,555	10/09/2001	Jeffrey J. Walls	10008320-1	7156

7590 02/01/2008

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EXAMINER	
MADAMBA, GLENFORD J	
ART UNIT	**PAPER NUMBER**
2151	
MAIL DATE	**DELIVERY MODE**
02/01/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/974,555	WALLS ET AL.	
	Examiner	Art Unit	
	Glenford Madamba	2151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Remarks

1. This action is in response to remarks filed by Applicant's representative on November 21, 2007.

Response to Arguments

2. With respect to Applicant's latest submission, the Office has given consideration to the remarks filed on November 21, 2007, but has deemed the arguments unpersuasive and/or insufficient to overcome the current rejection of the claims in view of the prior art references used in the Office Action submitted, as will be discussed below.

With regards to the rejection of the claims in view of the Ludtke and Jenkins prior art references, Applicant firstly argues that Ludtke and Jenkins, neither individually or in combination, teaches, suggests or discloses the recited features of claim 1, which recites in part:

"configuring graphics circuits of the plurality of networked slave computers in accordance with the compatible operating configuration to cooperate to collectively render a display, wherein the compatible operating configuration specifies a particular display operating mode."

The Office respectfully disagrees and maintains that the above recited features of the claim are expressly taught by the combination of Ludtke and Jenkins, and that Applicant has misinterpreted and/or not fully considered all of the teachings and disclosures of the prior art references used in the rejection of the claim.

In support of his argument, Applicant remarks that the added features are not taught by Jenkins, and that "Jenkins does not disclose anything that wasn't admitted prior art in the present application." In this regard, Applicant argues that while Single Logical Screens (SLS) are well-known in the art, as noted by the present application, "Jenkins teaches a touch-sensitive video display formed from a plurality of individual displays and does not teach anything 'relevant' beyond that." The Office respectfully disagrees.

In addition to the general disclosures cited by the Office as teaching the recited features of the claim [col 1, L10-20 & col 4, L21 – col 5, L27], Jenkins expressly teaches the argued feature of "configuring *graphics circuits* of the plurality of networked slave computers...*to collectively render a display*, wherein the compatible operating configuration specifies *a particular display operating mode*." For example, referencing Figures 1, 2, 8 and 9, Jenkins expressly teaches that Basic Display Unit elements (BDUs) 1A-1T can be arranged and/or combined logically to form one large display, such as Display Unit 10 [col 2, L59 – col 3, L10] [col 3, L66 – col 4, L15]. Jenkins additionally teaches that the display capability is distributed over the respective BDU

processors; that is, the processor *in each* BDU 1A-1T controls the content of its own screen, but does so either *in response to 'control signals' received from another BDU 1* (e.g., the *Controlling BDU*) connected thereto [col 4, L28-35] [col 4, L53-59]. Jenkins teaches that each of the displays is 'pixel based', such that each picture element of the display can be set either 'on' or 'off' (for monochrome display 'mode') or to one of a fixed number of different shades (greyscale display 'mode') or colours (colour display 'mode'). Each BDU also has *drivers* that receive standard video (e.g., R, G, B) and 'maps' the video signals onto the display 2 [col 2, L25-35].

Jenkins discloses that each BDU 1A-1T is characterized by pixel width 'w' and height 'h' [col 4, L41-47] [Fig. 7]. Specifically, Jenkins teaches that "each BDU 1A-1T has an *associated graphics processor* which 'maps' a set of graphics instructions for controlling the associated display 2. Graphic processors permit *Setpixel operations* for 'changing the state of an *individual pixel*', while more complex graphics processors permit operations such as *DrawLine* for 'drawing a line in space', as well as other complex operations." [col 4, L66 – col 7, L5]. As an example, Jenkins discloses that in order to implement the DU operation *Putline* (r1, c1, r2, c2) to "draw a line" (thus, 'rendering') in DU coordinates, the *controlling processor*, BDU 1D, sends *PutLine* commands via the network 15 to each of the other BDUs that make up the DU 10. Thus, the DU driver (controlling processor) sends to the (i, j,)th BDU the graphical instruction *PutLine* (r1-h*I, c1-w*j, r2-h*I, c2-w*j). Each BDU graphic processor clips the graphical instruction to its own physical coordinate system [col 5, L10-28]. In another

example, Jenkins teaches that controlling processor "transmits requests to each of the graphics processors of each of the other BDU's physical coordinates, and the graphics processors then cause the DU screen to be 'cleared' (e.g., clearing to 'black'). 'Computations' are performed by a DU controlling processor transmitting commands to the slave BDUs, including *complex operations* [col 5, L50 – col 6, L40].

As clarified described by Applicant's himself, "Rendering (of a graphics image) refers to 'computations' that are involved in generating the underlying graphics information for display...it is important that each of the cooperating render nodes be configured for rendering the information for display in a particular (and consistent) display mode." In this regard, and as shown above, Jenkin expressly teaches "drawing" (in pixel space, and thus rendering) of graphical images for display onto a large 'logical' screen by networked slave processors, according to graphical commands / instructions sent by a controlling processor to the slave processors. As noted above, Jenkin teaches and discloses that "simple graphics processors permit *setpixel operations* for changing the state of an individual pixel, while *more complex graphics processors* permit 'operations' such as *DrawLine* for 'drawing' a line in pixel space, as well as other *complex operations* [col 5, L1-10]. Jenkin also additionally and expressly teaches that each display 2 is 'pixel-based', such that each picture can be set to operate in one of either a 'monochrome' display, a 'greyscale' display mode or color display mode of operation. The feature of a 'particular display operating mode' is also thus expressly disclosed by Jenkin.

Given the above, the argued feature of "*configuring graphics circuits of the plurality of networked slave computers* (e.g., via Graphical Instructions / Commands, such as DrawLine or PutLine) in accordance with the compatible operating configuration to cooperate *to collectively 'render' a* display (e.g, Single Logical Display), wherein the compatible operating configuration specifies a particular display operating mode"(e.g., Monochrome / Greyscale / Color 'modes' of operation), as recited by the claim, is thus expressly disclosed by Jenkins.

With regards to the claim, Applicant secondly argues that the combination of the Ludtke and Jenkin prior art references is improper and embodies hindsight rationale. In response to this argument, the Office respectfully firstly reminds Applicant that the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both Ludtke and Jenkin prior art references are both concerned with the same endeavor of "displaying a graphical image across several display devices to come up with a single logical image." But while Ludtke and Jenkin both generally discloses the recited feature of "configuring graphics circuits of a plurality of networked slave processors..." [Ludtke: col 5, L55 – col 6, L15],

the additional recited features of "configuring the graphics 'cards' or processors of the networked slave computers to collectively '*render* a display', wherein the compatible operating configuration specifies a particular operating mode" is more expressly disclosed by Jenkin in a related endeavor, as explained and cited previously above in response to the arguments.

The combination is proper because, in addition to the fact that both prior art references are in the same field of endeavor and address the same general problem (displaying a video / graphics image across several display devices), the system disclosed by Jenkin includes an added feature of 'tiling' of touch-sensitive display screens that allows for user input and correspondingly *draws* an output 'display image', under the control of a master processor providing graphical commands and instructions. This goes beyond Ludtke's objective of merely 'displaying' graphical images across several networked screens to come up with a single logical display'. While both Ludtke and Jenkin disclose a method of configuring networked slave computers for cooperatively outputting a logical graphical display image, Jenkin discloses the same system that is also capable of supporting 'human-machine' interaction (touch-sensitive display screens), as well as the 'rendering' methodologies (SetPixel, Drawline, Putline pixel operations / computations) and display mode of operations (Monochrome, Greyscale, Color Mode Display) necessary to achieve the system.

Also, in response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that

any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

With regards to the rejection of claims 2, 9 and 19 as being obvious in view of Ludtke, Jenkin and Lavelle, Applicant also alleges that the motivation to combine provided by the Office action is 'improper'. In response to the Applicant's argument concerning 'improper motivation to combine' and 'hindsight reasoning', the Office asserts that proper motivation to combine the prior art references has been appropriately and sufficiently provided, and the rejection of the above claims is maintained at least for the same reasons provided above for claim 1.

Since it has been shown that the combination of Ludtke, Jenkin and/or Lavelle, either individually or in combination discloses the argued features of the argued claims, the Office accordingly maintains its rejection of the claims.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 5-8, 10, and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ludtke et al (hereinafter Ludtke). U.S. Patent 6,501,441 in view of Jenkin et al (hereinafter Jenkin), U.S. Patent 6,118,433.

As per claims 1, 8 and 17, Ludtke in view of Jenkin discloses a method for configuring a plurality of networked slave computers (24-40) to cooperate to collectively render a display comprising [Abstract]:

specifying, at a master computer (22), compatible operating configuration for each of the plurality of slave computers [Col 3, Lines 27-33] [Figs. 2-4];

communicating, across the network (e.g., high-speed serial interface) [Col 23 Lines 56-58], the specified configuration to each of the plurality of slave computers [Col 19, Lines 53-66] [Col 24, Lines 27-28] [Fig. 2]; and

configuring graphics circuits of the plurality of networked slave computers in accordance with the compatible operating configuration to cooperate to collectively

render a display, wherein the compatible operating configuration specifies a particular display operating mode.

Further, with regards to the claim, while Ludtke discloses substantial features of the invention such as the method of claim 1, and a method for configuring a plurality of networked slave computers to cooperate to collectively render a display [Fig. 2], he does not expressly disclose the additionally recited feature of configuring graphics circuits of the plurality of networked slave computers in accordance with the compatible operating configuration to cooperate to collectively render a display, wherein the compatible operating configuring specifies a particular display operating mode. The feature is disclosed by Jenkin in a related endeavor.

Jenkin discloses as his invention a video surface constructed by adjoining a large number of flat screen display devices together. Each screen on this surface is controlled by its own computer processor and these processors are networked together [Abstract] [Figs. 2 & 5-7]. In particular, Lech discloses the additional recited feature of configuring graphics circuits (e.g., graphics processors of the display units {DUs} of the plurality of networked slave computers in accordance with the compatible operating configuration to cooperate to collectively render a display [col 1, L10-20] (i.e., via graphical display commands) [col 4,L52-59], wherein the compatible operating configuring specifies a particular display operating mode (e.g., operating under a "monochrome", "greyscale", or "color" display) [col 2, L1 – col 3, L10] [col 4, L21 – col 5, L27] [Figs. 8 & 9].

It would thus be obvious to one of ordinary skill in the art at the time of the invention to combine and/or modify Ludtke's invention with the above added feature, as disclosed by Jenkin, for the motivation of providing a video display, and in particular, for construction of a 'large' video display unit capable of supporting user interaction [col 1, L1-8].

In considering Claim 8, in addition to the reasons cited above for claim 1, Ludtke points out that the configuration provided in Figure 2 is exemplary only and that it is apparent that an audio/video network could include many different combinations of components [Col 8, Lines 29-31]. It is inherent that the invention can therefore be applied to expanded versions of the network configuration illustrated, such as pluralities of the described network configuration. In fact, Ludtke teaches in the embodiment of his invention that a *parameter configuration_ID* is used to specify which particular multiple display configuration is being configured, assuming the master device (22) supports more than one multiple display configuration [Col 20, Lines 41-43].

Claim 17 is also rejected for the same reasons provided as it differs only by its statutory category.

As per claims 3, 10 and 18, Ludtke (in view of Jenkin) discloses the method of claim 1, wherein the step of communicating the specified configuration comprises saving at least one slave configuration file in a predetermined location on each of the plurality of slave computers.

In one of his claims for the invention [Col 25, Lines 40-46], Ludtke discloses a method that has as one of its steps, transmitting each scaled image section to each appropriate display device, wherein the step of transmitting each scaled image section includes combining data representing the scaled image section for an appropriate display device in a stream of data packets, *each including an address value corresponding to a memory location within the appropriate display device.* Further, Ludtke discloses a method wherein a trigger packet, which includes a trigger bit, is sent and signals that storage of a current scaled image for display by the appropriate display device is complete [Col 25, Lines 65-67 & Col 26, Lines 1-2].

Claims 10 and 18 are also rejected in that they make the same assertion as Claim 3 and are differentiated only by their statutory category.

As per claims 5, 6, 12, 13 and 15, Ludtke (in view of Jenkin) discloses the method of claim 1, wherein the step of specifying, at a master computer, operating configurations further comprises the step of reading, by the master computer, a master configuration file that is stored in a predetermined location.

Claim 6 declares the method of claim 5, wherein the step of specifying, at a master computer, operating configurations further comprises the step of translating information from the master configuration file and saving the translated information into a plurality of slave configuration files.

In considering Claims 5 and 6, Ludtke specifies a multiple display configuration system comprised, in part, by:

a master device coupled to the plurality of display devices comprising:

i. a master communications circuit configured for receiving and transmitting data; and

ii. a control circuit coupled to the master communications circuit for partitioning an image into a plurality of image sections each corresponding to one of the display devices and assigning each image section to a corresponding display device.

[Col 26, Lines 38-46].

Ludtke additionally points out as a preference that management support and controls for the multiple display configuration are exposed to control devices on the serial bus network, *allowing the control devices to issue commands to the master device concerning the configuration of the multiple display configuration* [Col 19, Lines 53-66]. As shown in Figure 3 for the reference (Ludtke), the master device has memory

components (i.e., main memory, video memory, and mass storage) for storage of control commands/specifications received from control devices to which it is coupled.

The steps of capturing and scaling each image section are performed by a master device (22) on each appropriate image section [Col 24, Lines 38-39, Col 25 Lines 34-39] before each data stream is transmitted to the appropriate display device.

Claims 12, 13, and 15 are also rejected in that they make the same assertion as Claims 5 and/or Claim 6, and are differentiated only by their statutory category.

As per claims 7, 14 and 16, Ludtke (in view of Jenkin) discloses the method of claim 5, wherein the step of specifying, at a master computer, operating configurations further comprises the step of translating information from the master configuration file and communicating the translated information to the plurality of slave computers.

Ludtke, in his preferred embodiment teaches that a *configure command* is utilized by a control device to initially set up a multiple display configuration and to change an existing multiple display configuration [Col 19 Lines 63-66]. The master device (22) issues the appropriate commands to each display device (24-40) to set each display device to the appropriate resolution before the master device (22) configures the display devices (24-40) for the multiple display configuration [Col 20, Lines 26-29]. A subsequent configuration command using the same identification value

(parameter configuration_ID) would cause a change to the specified multiple display configuration [Col 20, Lines 47-49].

Ludtke also teaches in an alternative embodiment that given an original data stream (video stream) the master device *decodes* the frame data, partitions the image data into each image section corresponding to each display device, scales the image data, *re-encodes* the scaled image data for each image section on separate isochronous streams and *transmits* the encoded and scaled image data for each image section on separate isochronous channels, one directed to each of the display devices, as appropriate. The display devices (24-40) then display the encoded and scaled image data at an appropriate time, as specified by the master device (22) [Col 22, Lines 42-53].

Claims 14 and 16 are also rejected in that they make the same assertion as Claim 7 and are differentiated only by their statutory category.

3. Claims 2, 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ludtke et al (hereinafter Ludtke). U.S. Patent 6,501,441 in view of Jenkin et al (hereinafter Jenkin), U.S. Patent 6,118,433 and in futher view of Lavelle, U.S. Patent 6,875,322 B2.

As per claims 2, 9 and 19, Ludtke in view of Jenkin and in further view of Lavelle discloses the method of claim 1, wherein the step of communicating the specified configuration comprises communicating the specified configuration through a communication socket of each of the plurality of slave computers, and wherein the particular display operating mode is a stereo mode.

Ludtke discloses a multiple display configuration system comprising, in part, of a display communications circuit configured for receiving and transmitting data [Col 26, Lines 24-27].

While the combination of Ludtke and Jenkin disclose substantial features of the invention such as the method of claim 1, and a method for configuring a plurality of networked slave computers to cooperate to collectively render a display [Fig. 2], including communicating the specified configuration comprises communicating the specified configuration through a communication socket of each of the plurality of slave computers (e.g., via video drivers) [Jenkin: col 3, L8], the combination does not expressly disclose the additionally recited feature of communicating the specified configuration through a communication socket of each of the plurality of slave computers, and wherein the particular display operating mode is a stereo mode. The feature is disclosed by Lavelle in a related endeavor.

Lavelle discloses as his invention a graphics system including a hardware accelerator and a frame buffer. The frame buffer includes a sample storage area and a

double-bufferred display pixel area. The hardware accelerator is operable to (a) render a stream of primitives into samples, (b) store the samples into the sample storage area of the frame buffer, (c) read the samples from the sample storage area, (d) filter the samples to generate pixels, and (e) store the pixels into a first buffer of the display pixel area of the frame buffer. Furhtermore, the hardware accelerator is operable to perform (a) through (e) and one or more times on one or more corresponding streams of primitives to complete a frame of an animation before passing control of the first buffer to a video output processor [Abstract]. In particular, Lavelle discloses the additional recited feature of communicating the specified configuration through a communication socket of each of the plurality of slave computers, and wherein the particular display operating mode is a stereo mode (e.g., "Stereo Display") [Fig. 22].

It would thus be obvious to one of ordinary skill in the art at the time of the invention to modify the combination of Ludtke and Jenkin with the above additional feature, as disclosed by Lavelle, for the motivation of providing a graphics computing system for dynamically adjusting a number of rendering passes to achieve a targeted quality constraint [col 1, L15-20].

Claims 9 and 19 are also rejected for the same reason cited above as they differ only by their statutory category.

4. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ludtke et al (hereinafter Ludtke). U.S. Patent 6,501,441 in view of Jenkin et al (hereinafter Jenkin), U.S. Patent 6,118,433 and in futher view of Obviousness.

As per claims 4 and 11, Ludtke in view of Jenkin and in futher view of Obviousness discloses the method of claim 3, wherein the step of saving at least one configuration file comprises saving the at least one slave configuration file using a predetermined filename.

In considering Claim 4, it would be obvious to one of ordinary skill to ascertain from the teachings of Ludtke that the transmittal of encoded data packets to an address corresponding to a memory location within each one of the display devices in the multiple display configuration would be contained in some standard file format (i.e., MPEG or DV file) with a predetermined filename as its identifier [Col 25, Lines 61-64].

Claim 11 is also rejected for the same reason provided as it differs only by its statutory category.

Conclusion

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the

event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenford Madamba whose telephone number is 571-272-7989. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Valencia Wallace Martin can be reached on 571-272-3440. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Glenford Madamba
Examiner
Art Unit 2151

JOHN FOLLANSBEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100